



# ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: SaM146-1S17  
 UNIQUE ID NUMBER: 01P11PJ003  
 COMBUSTOR:  
 ENGINE TYPE: MTF

BYPASS RATIO: 4.4  
 PRESSURE RATIO ( $\pi_{00}$ ): 21.9  
 RATED THRUST ( $F_{00}$ ) (kN): 69.2

### REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
D <sub>p</sub> /F <sub>00</sub> (g/kN) or SN	3.1	78.6	42.8	14.8
AS % OF ORIGINAL LIMIT	15.8	66.6	51.1	56.5
AS % OF CAEP/2 LIMIT (NO <sub>x</sub> )			63.9	
AS % OF CAEP/4 LIMIT (NO <sub>x</sub> )			73.7	
AS % OF CAEP/6 LIMIT (NO <sub>x</sub> )			79.7	
AS % OF CAEP/8 LIMIT (NO <sub>x</sub> )			91.9	

For non-volatile particulate matter (nvPM) emissions, please refer to the ICAO Engine nvPM Emissions Data Sheet.

### DATA STATUS

- PRE-REGULATION  
 x CERTIFICATION  
 - REVISED (SEE REMARKS)

### TEST ENGINE STATUS

x NEWLY MANUFACTURED ENGINES  
 x DEDICATED ENGINES TO PRODUCTION STANDARD  
 - OTHER (SEE REMARKS)

### EMISSIONS STATUS

x DATA CORRECTED TO REFERENCE  
 (ANNEX 16 VOLUME II)

### CURRENT ENGINE STATUS

(IN PRODUCTION, IN SERVICE UNLESS OTHERWISE NOTED)  
 - OUT OF PRODUCTION (DATE: - )  
 - OUT OF SERVICE (DATE: - )

### MEASURED DATA

MODE	POWER SETTING (%F <sub>00</sub> )	TIME (minutes)	FUEL FLOW (kg/s)	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
				HC	CO	NO <sub>x</sub>	
TAKE-OFF	100	0.7	0.791	0.03	0.26	16.37	12.6
CLIMB OUT	85	2.2	0.653	0.04	0.36	13.89	11.7
APPROACH	30	4.0	0.228	0.06	5.07	7.10	0.1
IDLE	7	26.0	0.097	1.05	29.36	3.73	0.1
LTO TOTAL FUEL (kg) or EMISSIONS (g)			326	167	4776	2695	-
NUMBER OF ENGINES				2	2	2	2
NUMBER OF TESTS				5	5	5	5
AVERAGE D <sub>p</sub> /F <sub>00</sub> (g/kN) or AVERAGE SN (MAX)				2.4	69.0	38.9	12.6
SIGMA (D <sub>p</sub> /F <sub>00</sub> in g/kN, or SN)							
RANGE (D <sub>p</sub> /F <sub>00</sub> in g/kN, or SN)							

### ACCESSORY LOADS

POWER EXTRACTION - (kW) AT - POWER SETTINGS  
 STAGE BLEED - (% CORE FLOW) AT - POWER SETTINGS

### ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	100.4-101.3
TEMPERATURE (K)	289.2-302.5
ABS HUMIDITY (kg/kg)	0.00619-0.01331

### FUEL

SPEC	Jet A-1
H/C	1.92
AROM (%)	16.7-17.5

MANUFACTURER: PowerJet S.A.  
 TEST ORGANIZATION: PowerJet S.A.  
 TEST LOCATION: Villaroche, France and Rybinsk, Russia  
 TEST DATES: 01/07/2009-01/05/2011

### NO<sub>x</sub> REGULATION PARAGRAPH

	2.3.2 c) (CAEP/4)
x	2.3.2 d) (CAEP/6)
	2.3.2 e) (CAEP/8)

### REMARKS

1. Test engine 146-006/1A and test engine 146-101/3
2. Certification report CR-037 Rev.1 and CR-037 S1
3. Certification in accordance with Part III, Chapter 2, of Amendment 6 of ICAO Annex 16 Vol. II.
4. NO<sub>x</sub> levels in accordance with Part III, Chapter 2, 2.3.2 d) (CAEP/6)

Compliance with Fuel Venting requirements: x ('x' if complies, 'PR' if pre-regulation, '-' if information is not available)